

## CLAIMS

1. Method for the separation of particles (40, 42) with different sizes, immersed in a liquid, this method including:

- 5       - introduction of radiation (30) in a waveguide (20), coupled to a second guide in a coupling area, this radiation entraining all particles towards the coupling area,
- separation of the particles as they pass into the coupling area.

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2. Method according to claim 1, the distance between the two guides in the coupling area being less than 5  $\mu\text{m}$ .

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3. Method according to either claim 1 or 2, the length of the coupling area being between 10  $\mu\text{m}$  and 50  $\mu\text{m}$ .

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4. Method according to one of claims 1 to 3, the particles being cells or macromolecules or microballs.

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5. Method according to one of claims 1 to 4, the injected radiation being in a spectral range between the near ultraviolet and the infrared.

6. Method according to one of claims 1 to 3, the particles being microballs, and microball marked cells, and the radiation being in the infrared range.

7. Method according to one of claims 1 to 6, the diameter of the particles being between firstly 100 nm and 500 nm, and secondly between 600 nm and 1.5  $\mu\text{m}$  or between 1  $\mu\text{m}$  and 100  $\mu\text{m}$ .

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8. Method according to one of claims 1 to 7, the liquid in which the particles are immersed being water or a cell suspension medium.

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9. Method according to one of claims 1 to 8, some particles being metallic or being marked by metallic particles.

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10. Method according to claim 9, some particles being gold particles or being marked by gold particles.

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11. Method according to one of claims 1 to 10, the radiation injected in the waveguide being polarised in transverse magnetic mode.

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12. Particle separation device, comprising two optical guides (20, 22) coupled by a coupling area with a length between 10  $\mu\text{m}$  and 50  $\mu\text{m}$ , the distance between the guides being less than 5  $\mu\text{m}$ .

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13. Device according to claim 12, also comprising means (162) of sending radiation with a wavelength of between 300 nm and 1.2  $\mu\text{m}$  or even 1  $\mu\text{m}$  and 1.2  $\mu\text{m}$  in one of these guides.

14. Device according to either claim 12 or 13, also comprising means (162) of sending radiation polarised in transverse magnetic mode in one of these guides.

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15. Device according to one of claims 12 to 14, also comprising means (160, 170) of displaying separation of particles.